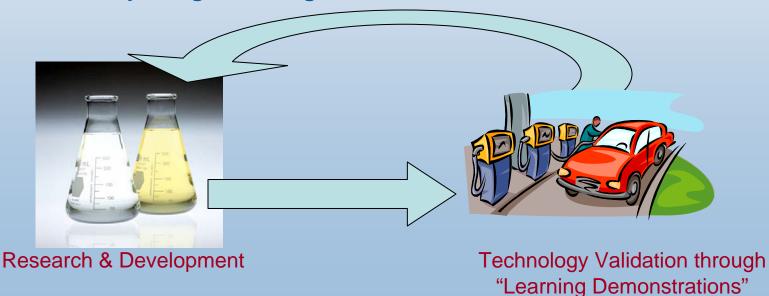
Controlled Hydrogen Fleet and Infrastructure Demonstration and Validation Project

Nancy Garland, U.S. Department of Energy

IPHE Steering Committee Meeting
Paris, France
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Technology Validation Strategy

- Conduct learning demonstration of hydrogen infrastructure in parallel with demonstration of direct hydrogen fuel cell vehicles to allow a **commercialization decision** by 2015
- Test, demonstrate, and validate complete systems solutions
- Refocus Hydrogen Program R&D

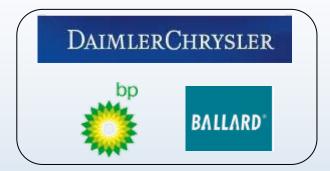


Transportation and Infrastructure Timeline

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	Phase 1 Technical Feasibility	Phase 2 Controlled Fleet Test and Evaluation		Phase 3 Commercial Readiness Demonstrations		Commercialization Phase	
Vehicles Objective	Test FC vehicle performance and feasibility	Evaluate use of FC vehicles under real-world conditions		Demonstrate commercial viability of FC Fleet Vehicles		Investment to establish manufacturing plants & sales/service	
Infrastructure Objective	Demonstrate H ₂ fueling station; Analyze fuel options Primarily trucked in liquid	Onsite gener multiple fe Renewable 8	edstocks	Demonstrate viability of I infrastro Most cost effe by reg	hydrogen ucture ctive sources	Investment for substantial numbers of all stations to be H ₂ capable	
Go/No Go Decision Points		Decision Criteria – Commercialization					
			Phase 2: Validate hydrogen vehicles that have greater than a 250-mile range, 2,000-hour fuel cell durability and hydrogen infrastructure that results in a hydrogen production cost of less than \$3.00/gge (untaxed), and safe and convenient refueling by trained drivers.		Validate hydrogen vehicles that have a 300+ mile range and 5,000 hours fuel cell durability, and hydrogen infrastructure that results in a hydrogen production cost of \$1.50/gge (untaxed)1, and safe and convenient refueling by trained drivers.		
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R&D continues concurrently to address key cost and performance barriers							

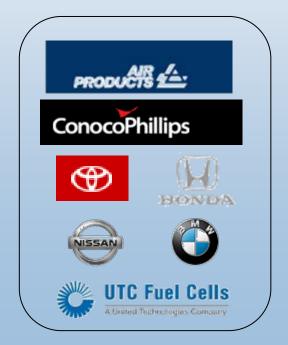
Solicitation Issued and Successful Teams Announced











Testing under different climatic conditions

Northern California



Southeast Michigan



Southern California



Hydrogen Fueling Stations

Proposed Stations

DaimlerChrysler and BP

General Motors and Shell

ChevronTexaco and Hyundai

Ford and BP

Existing Stations

Other Companies

Freeway System by Class

Interstate

US Highway

State Highway

Mid-Atlantic



Detailed Vehicle Data Collected

- Operations
 - Fuel economy
 - Range
 - Vehicle refueling time
- Vehicle Fuel Cell Systems and Components
 - Durability
 - Efficiency
 - H₂ tank cycle life
- Performance
 - Top speed, Acceleration
 - Gradeability
 - Minimum/maximum temperature
 - Cold drive-away
 - Emissions
- Safety
 - Unplanned failures
 - Fuel tank release
 - Grounding, sensor, and passenger compartment alarm

Infrastructure Data Collected

- Infrastructure Performance Measures
 - Site
 - Purity of hydrogen from storage tank
 - Fueling System
 - Durability
 - Hydrogen production and delivery, refueling rate
 - Safety
 - Release of hydrogen from fueling connector
- Fuel cell co-generation facility (Optional)
 - Cost of co-generation
 - Fuel cell durability
 - Electrical efficiency of fuel cell
 - Safety
 - Electrical overload
 - Ground short
 - Alarms

Potential IPHE Project: Harmonize Data Protocols

- The US Learning Demonstration:
 - > Performance measures established
 - Data validates technology readiness
 - ➤ Data focuses research program

 Potential IPHE project: harmonize global demonstration test protocols to be able to achieve the above objectives